

WHAT IS CLAIMED IS

1. A process for producing adamantanes by isomerizing a tricyclic saturated hydrocarbon compound having 10 or more carbon atoms, wherein the process comprises: (A) a reaction step for isomerizing a raw material; (B) a concentration step for concentrating the adamantanes in a reaction product liquid; (C) a crystallization step for crystallizing the concentrated adamantanes; (D) a solid-liquid separation step for separating crystallized adamantanes from slurry having precipitated crystals; (E) a washing step for washing the crystal of adamantanes obtained by the solid-liquid separation step; and (F) a drying step for drying the washed crystals of adamantanes.
2. The process for producing adamantanes according to Claim 1, wherein the tricyclic saturated hydrocarbon compound having 10 or more carbon atoms is a compound obtained by hydrogenation of a tricyclic unsaturated hydrocarbon compound having 10 or more carbon atoms.
3. The process for producing adamantanes according to Claim 1, wherein a solid catalyst is used in the reaction step for isomerizing.
4. The process for producing adamantanes according to Claim 1, wherein a flash tower or a distillation column singly or a plurality thereof in combination are used for concentration treatment in the concentration step, and at least a part of a column-top distillate is reused as a solvent in the reaction step, or at least a part of the column-top distillate is used as a recrystallization solvent in the crystallization step.
5. The process for producing adamantanes according to Claim 1, wherein cooling crystallization, evaporative crystallization, or the combination thereof are used for the crystallization operation in the crystallization step.

6. The process for producing adamantanes according to Claim 1, wherein a recrystallization step and a re-washing step are provided between the solid-liquid separation step or the washing step and the drying step, and at least a part of a mother liquor formed in these steps is reused by recirculating as a part of the solvent or the raw material in the reaction step, or by recirculating to the concentration step or to the crystallization step.

7. The process for producing adamantanes according to Claim 1, wherein the reaction step, concentration step, crystallization step, and solid-liquid separation step are operated using either a batch-wise system or a continuous system.

8. A process for producing adamantanes, wherein the adamantanes produced by isomerizing a tricyclic saturated hydrocarbon compound having 10 or more carbon atoms in the presence of a solid catalyst are purified by a crystallization operation.

9. The process for producing adamantanes according to Claim 8, wherein the crystallization operation refers to a cooling crystallization operation, a evaporative crystallization operation, or the combination thereof.

10. The process for producing adamantanes according to Claim 8, wherein the crystallization operation is performed using a continuous system or a batch-wise system.

11. The process for producing adamantanes according to Claim 8, wherein the cooling crystallization operation or the evaporative crystallization operation is performed in the temperature range from -20 to 50°C.

12. A process for producing adamantanes, wherein crude adamantanes produced by isomerizing a tricyclic saturated hydrocarbon compound having 10 or more carbon atoms are washed by a washing solvent after separating the adamantanes by a crystallization step and a solid-liquid separation step.

13. The process for producing adamantanes according to Claim 12, wherein the tricyclic saturated hydrocarbon compound having 10 or more carbon atoms refers to trimethylenenorbornane.

14. The process for producing adamantanes according to Claim 12, wherein the washing solvent refers to at least a solvent selected from the group consisting of alcohols, ketones and carboxylic acids having a boiling point of 150°C or less.

15. The process for producing adamantanes according to Claim 12, wherein the washing solvent in the amount ranging from 10 to 300% by mass relative to the crude adamantanes is used.

16. The process for producing adamantanes according to Claim 12, wherein the washing solvent in the amount ranging from 100 to 500% by mass is used to make slurry, which is then filtered.

17. A process for producing adamantanes, wherein the adamantanes are produced by isomerizing a tricyclic saturated hydrocarbon compound having 10 or more carbon atoms, wherein crystals of the adamantanes containing a liquid fraction in the range from 5 to 50% by mass are dried.

18. The process for producing adamantanes according to Claim 17, wherein the tricyclic saturated hydrocarbon compound having 10 or more carbon atoms refers to trimethylenenorbornane.

19. The process for producing adamantanes according to Claim 17, wherein the adamantanes are dried by at least a method selected from the group consisting of convective drying method, radiative drying method, and conductive drying method.

20. The process for producing adamantanes according to Claim 17, wherein drying is performed by either a continuous system or a batch-wise system.

21. The process for producing adamantanes according to Claim 17, wherein the drying is performed under the conditions including a pressure in the range from 0.1 to 101 kPa, a temperature in the range from the boiling point of the washing solvent minus 50°C to the boiling point of the solvent.

22. The process for producing adamantanes according to Claim 17, wherein the drying is performed by stirring and/or shaking.